Claims

1. A process for producing a rotor blade for a wind power system, wherein at least two rotor blade elements are arranged one behind the other in a longitudinal direction of the rotor blade and are glued together via at least one, preferably at least two connecting elements bridging a partition line between the rotor blade elements, characterized in that at least one connecting element is aligned with said rotor blade elements, wherein a hollow space is formed between an outer delimitation surface of at least one of the rotor blade elements and at least one fixing segment of the inner delimitation surface of said connecting element, and subsequently the hollow space is flooded with an adhesive (resin).

2. The process according to claim 1, characterized in that the alignment of the connecting element is locked before flooding the hollow space by gluing a locking rim of the inner delimitation surface of the connecting element, at least partially surrounding the fixing segment, to an outer delimitation surface of at least one of the rotor blade elements.

3. The process according to claim 2, characterized in that said hollow space is sealed tightly at least in the region of the locking rim.

4. The process according to claim 2 or claim 3, characterized in that the connecting element is glued to at least one of the rotor blade elements in the region of the locking rim with a thickened epoxy resin and/or polyester resin.

5. The process according to one of the preceding claims, characterized in that, for flooding, a negative pressure is generated in the hollow space and/or the adhesive (resin) is pumped into the hollow space with overpressure.

6. The process according to one of the preceding claims, characterized in that the hollow space is flooded with an adhesive with a dynamic viscosity η in the range of about 130 - 230, preferably about 150 - 210, particularly preferably about 170 - 190, in particular about 180 Mpas and/or a kinematic viscosity $\nu = \eta/\rho$ in the range of about 1.2 - 2 x 10^5 m^2/s, preferably 1.4 - 1.8 x 10^5 m^2/s, in particular about 1.6 x 10^5 m^2/s.

7. The process according to one of the preceding claims, characterized in that said hollow space is flooded with liquid epoxy resin and/or polyester resin.

8. The process according to one of the preceding claims, characterized in that after flooding, the adhesive hardens at room temperature and/or for a period of time of 6 to 10 hours at a temperature of about 70°C.

9. The process according to one of the preceding claims, characterized in that the supply of resin is effected at the deepest location of the hollow space as seen from the outer delimitation surface of the rotor blade and/or the negative pressure is generated at the location which is located highest.

10. The process according to one of the preceding claims, characterized in that said rotor blade elements are produced in the same mold, in which, at the desired place of separation, a forming part, and, if necessary, for the

formation of the hollow space, a separating film is inserted.

11. The process according to claim 10, characterized in that at least one connecting element is produced in the same mold as the rotor blade elements.

12. A rotor blade for the rotor of a wind power system produced by means of a process according to one of the preceding claims having at least two rotor blade elements arranged one behind the other in a longitudinal direction of the rotor blade and being glued together, comprising at least one, preferably at least two connecting elements bridging a partition line between the rotor blade elements and having at least two adherend segments, wherein each of them is glued together with one of the rotor blade elements over a large surface.

13. The rotor blade according to claim 12, characterized in that said connecting element is at least partially accommodated in a recess formed by the outer delimitation surfaces of the rotor blade elements in the region of the separation line.

14. The rotor blade according to claim 13, characterized in that said recess at least partially surrounds the longitudinal axis of the rotor blade.

15. The rotor blade according to claim 13 or claim 14, characterized in that the outer circumference of at least one rotor blade element tapers towards the separation line preferably in a wedge-shaped manner in a cutting plane extending perpendicularly to the longitudinal axis for forming the recess.

16. The rotor blade according to one of claims 13 to 15, characterized in that said connecting element has an inner delimitation surface extending in a complementary manner to the profile of the recess.

17. The rotor blade according to one of claims 13 to 16, characterized in that the connecting element has an outer surface which is flush with the adjacent regions of the outer surfaces of the rotor blade elements.

18. The rotor blade according to one claims 1 to 17, characterized in that at least one connecting element has a construction corresponding to the construction of adjacent regions of the rotor blade elements, preferably a laminate-shaped construction.

19. The rotor blade according to one of the preceding claims, characterized in that at least one rotor blade element is constructed as a hollow body with a shell accommodating at least one bar absorbing bending forces.

20. A wind power system according to one of claims 12 to 19 having a rotor having at least one rotor blade and being pivoted about a rotor axis extending approximately horizontally.

21. A rotor blade element for the rotor of a wind power system,

wherein the rotor blade element is connectable with at least one further rotor blade element to form a rotor blade, and the rotor blade element has a recess at the end connectable with the further rotor blade element which is part of a space filled with adhesive in the connected state.

22. A rotor blade element for a rotor blade of a wind power system, comprising

a shell; and

a diminution of the shell facing a separation line;

wherein the diminution is designed to form a hollow space with a connecting element necessary for assembly of the rotor blade.

23. The rotor blade element according to one of claims 21 to 22, wherein the rotor blade element is a prefabricated longitudinal module.

24. The rotor blade element according to one of claims 21 to 23, wherein the shell of the rotor blade element is one piece.

25. The rotor blade element according to one of claims 21 to 24, wherein the rotor blade element is at least four meters long.

26. A connecting element for connecting rotor blade elements for a rotor blade of a wind power system, comprising:

at least two fixing segments, and

locking segments surrounding said fixing segments,

wherein the connecting element has diminutions directed outwardly in the direction of the longitudinal axis of the rotor blade elements to be connected, and

wherein the diminutions are formed in such a way that the connecting element forms a hollow space with the rotor blade elements to be connected.